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AZ CORP COMMISSION
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September 9, 2010

Arizona Corporation Commission
DOCKETED
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DOCKETED BY

istin K. Mayes, Chairman
izona Corporation Commission
00 West Washington Street
ioenix, Arizona 85007-2996

: Battery Storage Research and Development for Use in Conjunction with Energy Efficiency and Renewable Energy Technology; 2011 REST and Energy Efficiency Implementation Plans; adding Sacramento Municipal Utility District Battery Storage Pilot to Requested Analysis in July 31,2010 letter; Docket Nos. ~~E-01345A-10-0262;~~ E-01345A-10-0219; and ~~E-01933A-10-0278~~.

ar Chairman Mayes:

ank you for your recent correspondence regarding battery storage programs. Tucson Electric wer Company ("TEP" or "Company") shares your support for the development and plementation of energy storage technologies.

ttery energy storage ("BES") is a promising and emerging technology. TEP believes that mmercially viable BES could play an important role in supporting renewable electric neration. In particular, TEP is interested in BES's ability to smooth intermittent resources g., solar and wind), to defer peaking capacity additions and to avoid on-peak energy expenses ough the storage of off-peak energy.

P is investigating the use of compressed air energy storage, hydrogen energy storage, and rmal storage (such as ice or molten salt) for the same benefits. As the use of renewable ergy in Arizona increases, storage technologies such as these will be essential in order for TEP achieve its distributed generation ("DG") goals. In the near future, the DG dispersion across P's service territory will be uneven. As a result, some areas will exhibit higher levels of DG d storage will be necessary to absorb those increased levels of intermittent energy.

e electric system of the future may be able to utilize distributed storage in the form of electric nicle batteries that are charged with renewable sources. If the two (battery and renewable

resource) are coupled through a smart grid, the intermittency and capacity problems of renewable energy can be eliminated. The next advancement would be to utilize the capacity of the car's battery through the smart grid to not only firm up the solar resource, but also to provide energy and capacity as a resource available to the utility.

The Company is studying and monitoring developments in this field, including the San Diego Gas & Electric ("SDG&E") and Sacramento Municipal Utility District ("SMUD") battery storage testing programs that you referenced. SDG&E is studying both utility and household scale applications of BES. SMUD is conducting a pilot program to examine the value of BES coupled with distributed photovoltaics on residential circuits with high photovoltaic penetration. TEP plans to utilize the information derived from these programs, along with other pilot programs, to promote cost-effective storage technologies for its customers.

TEP is an active participant in various projects, including:

- TEP's pilot project with Bell IPC for a small solar thermal plant using concentrated solar panels and thermal storage, which will provide many of the same benefits of BES;
- the development of a utility-scale battery storage system sited at the University of Arizona Technology Park to enhance some of the smaller solar photovoltaic projects going forward;
- retaining Utility Storage Engineering ("USE") to provide solar generation resource integration information at a feeder, substation, switchyard, and system-wide level;
- retaining USE to assess the impacts of a large ground mount and several roof mounted photovoltaic systems on two Davis Monthan distribution feeders; this data will enable TEP to assess the impacts to electrical supply characteristics of a high percentage of solar generation within a distribution feeder;
- utilizing the Electric Power Research Institute to benefit from studies they are conducting; and
- incorporating data from the interdisciplinary solar energy research conducted by the Arizona Research Institute for Solar Energy; this information is pivotal to the deployment and practical implementation of solar energy solutions.

The Company, with the University of Arizona, applied for a Department of Energy grant to investigate storage technologies, including BES. Although the grant was not awarded at the time, the Company will continue to apply for assistance to study this technology.

The Company continues to research and promote the benefits of BES and will follow closely the development of this technology. If you have any further questions regarding TEP's involvement with battery storage research, please do not hesitate to contact me.

Sincerely,

Raymond S. Heyman

cc:
Commissioner Gary Pierce
Commissioner Sandra Kennedy
Commissioner Paul Newman
Commissioner Bob Stump
Ernest Johnson
Steve Olea
Janice Alward
Lyn Farmer
Rebecca Wilder